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KERALA GAZETTE
അസാധാരണം
EXTRAORDINARY

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KERALA STATE ELECTRICITY REGULATORY COMMISSION, THIRUVANANTHAPURAM

NOTIFICATION

No. 3476/Con(T2)/2026/KSERC. *11th March, 2026.*

Preamble:—(1) In exercise of the powers conferred by Section 176 of the Electricity Act, 2003 (36 of 2003), the Ministry of Power, Government of India, issued the Electricity (Amendment) Rules, 2022 on 29th December 2022. Further, in exercise of the powers conferred under Rule 16(1) of the said Rules, the Government issued the 'Guidelines for Resource Adequacy Planning Framework for India' on 28th June 2023, in consultation with the Central Electricity Authority. Under Rule 16(2) of the said Rules, the State Commissions are required to frame regulations on resource adequacy, in accordance with the aforementioned guidelines and the model regulations, if any, framed by the Forum of Regulators. The Forum of Regulators framed the Model Regulations for Resource Adequacy Framework in June 2023.

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(2) In recent years, India has emerged as the fastest-growing large economy in the world. In parallel, Kerala has distinguished itself as a progressive State, consistently ranking among the top performers across several key indicators, including the Sustainable Development Goals, technology and innovation, per capita State Domestic Product, start-ups, IT services, and good governance.

Sustaining this growth momentum requires ensuring an adequate, reliable, and affordable supply of electricity. Generation capacity must be expanded in a manner that not only keeps pace with, but marginally exceeds, the growth in electricity demand so as to avoid power shortages that could impede economic development.

Furthermore, with the increasing share of renewable energy in the generation mix, characterized by variability, seasonality, and intermittency, it is imperative to undertake a robust assessment of demand supply dynamics of the power system. In this context, resource adequacy planning assumes critical importance as a key pillar of a modern electricity system. It provides a systematic framework to ensure long-term reliability and efficiency of power supply amidst rising demand and a rapidly transforming energy landscape. Resource Adequacy (RA) regulations are crucial for Kerala to ensure a reliable, cost-effective, and secure power supply as the State faces the dual challenges of climate change and rapid, high-level renewable energy (RE) penetration. With a goal to meet 100% of its energy needs through renewables by 2040 and a heavy reliance on external power imports, these regulations are essential to transition to a sustainable, resilient energy system without compromising grid stability.

In exercise of the powers conferred under section 181 of the Electricity Act, 2003 (36 of 2003), read with section 61, 66, and 86 thereof and all other powers enabling it in this behalf, and after previous publication, the Kerala State Electricity Regulatory Commission hereby makes the following Regulations, namely:-

Kerala State Electricity Regulatory Commission (Framework for Resource Adequacy) Regulations, 2026

CHAPTER 1
PRELIMINARY

1. *Short Title, Extent, and Commencement*.—

1.1. These Regulations shall be called the Kerala State Electricity Regulatory Commission (Framework for Resource Adequacy) Regulations, 2026.

1.2. These Regulations shall extend to the whole State of Kerala.

1.3. These Regulations shall come into force from the date of their notification in the Official Gazette of Kerala.

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2. *Objective.—*

2.1. The objective of these Regulations is to enable the implementation of Resource Adequacy framework by outlining a mechanism for planning of generation resources for reliably meeting the projected demand in compliance with specified reliability standards for serving the load with an optimum generation mix.

2.2. The Resource Adequacy framework shall cover a mechanism for demand assessment and forecasting, generation resource planning, procurement planning, and monitoring and compliance.

3. *Scope and Applicability.—*

3.1. These Regulations shall apply to the generating companies, distribution licensees, State Load Despatch Centre, State Transmission Utility, and other grid connected entities and stakeholders within the State of Kerala.

Provided that distribution licensees procuring bulk power from the seller licensee alone shall not be required to comply with separate Resource Adequacy obligations. However, such licensees shall furnish all requisite data and information to the seller licensee as may be required for the purpose of assessing and meeting the State's Resource Adequacy requirements.

4. *Definitions.—*

4.1. In these Regulations, unless the context otherwise requires,

(a) **"Act"** means the Electricity Act, 2003 (36 of 2003) and subsequent amendments thereof.

(b) "**Authority**" or **"CEA"** means the Central Electricity Authority referred to in sub-section (1) of Section 70 of the Act.

(c) "**Capacity Credit**" or "**CC**" means a firm capacity as a percentage of generation resource's installed nameplate capacity that can be counted towards resource adequacy requirements, which is arrived at in accordance with the applicable methodologies specified in Regulation 10 of these Regulations.

(d) **"Commission"** or "**State Commission**" means the Kerala Electricity Regulatory Commission (KSERC) constituted under the Act.

(e) **"Expected Energy Not Served"** or "**EENS**" means the expected amount of load (MWh) that may not be served for each year within the time horizon for Resource Adequacy planning.

(f) **"Long-Term"** for the Resource Adequacy planning means time horizon of ten (10) years for development of demand forecast, generation resource plan and procurement plan.

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(g) **"Long-Term Distribution Resource Adequacy Plan"** or **"LT-DRAP"** means plan for assessment of long-term resource adequacy by the distribution licensee in accordance with the methodology specified in these Regulations.

(h) **"Long-Term National Resource Adequacy Plan"** or **"LT-NRAP"** means plan for national level assessment of long-term resource adequacy published by the Authority in accordance with Resource Adequacy Guidelines.

(i) **"Long-Term Power Procurement"** or **"Long-Term Contracts"** means the procurement of electricity under any arrangement or agreement having a term or duration of seven years or more and up to twenty-five years**,** including arrangements or agreements that provide for an extension of up to five years at the option of the parties**,** or such other duration as may be specified from time to time under the Guidelines for Long-Term Procurement of Electricity issued by the Ministry of Power, Government of India**.**

(j) **"Loss of Load Probability"** or **"LOLP"** means probability that a system's load will exceed the generation and firm power contracts available to meet that load in a year.

(k) **"Medium-Term Power Procurement"** or **"Medium-Term Contracts"** means procurement of power under any arrangement or agreement with a term or duration of one year and above and up to seven years or such other duration specified in the guidelines for medium term procurement of electricity, issued by the Ministry of Power, Govt. of India from time to time.

(l) **"Net Load"** means the load derived upon exclusion of actual generation (MW) from renewable energy generation resources from gross load prevalent on the Grid during any time-block.

(m) **"Normalized Energy Not Served"** or **"NENS**" is normalization of the EENS by dividing it by the total system load.

(n) **"Planning Reserve Margin"** or **"PRM"** means a certain percentage of peak load forecast of the system, required for conforming to the reliable supply targets specified by the Authority/Commission from time to time.

(o) **"Resource Adequacy"** or **"RA**" means a mechanism to ensure adequate supply of generation to serve expected demand (including peak, off peak and in all operating conditions) reliably in compliance with specified reliability standards for serving the load with an optimum generation mix with a focus on integration of environmentally benign technologies after taking into account the need, inter alia, for flexible resources, storage systems for energy shift, and demand response measures for managing the intermittency and variability of renewable energy sources.

(p) **"RA Guidelines"** means Guidelines for Resource Adequacy planning framework for India notified by the Government of India in consultation with the Authority

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in pursuance of Rule 16 of the Electricity (Amendment) Rules, 2022 and its subsequent revisions/replacements from time to time.

(q) "**Short Term"** for the Resource Adequacy planning means time horizon of one year for development of demand forecast, generation resource plan, and procurement plan.

(r) **"Short-Term Distribution Resource Adequacy Plan"** or **"ST-DRAP"** means plan for assessment of short-term resource adequacy by the SLDC in accordance with the methodology specified in these Regulations.

(s) **"Short-Term National Resource Adequacy Plan"** or **"ST-NRAP"** means plan for national level assessment of short-term resource adequacy published by Grid India/National Load Despatch Centre in accordance with RA Guidelines.

(t) **"Short-Term Power Procurement"** or **"Short-Term Contracts"** means procurement of power under any arrangement or agreement including banking arrangements with a term or duration of one day above and up to one year or such other duration specified in the guidelines for short term procurement of Electricity, issued by the Ministry of Power, Govt. of India from time to time.

(u) "**State Level Planning Reserve Margin"** or **"State Level PRM"** means planning reserve margin determined by the distribution licensee in isolation with National Level PRM with reference to its own peak and electrical energy requirement under LTDRAP for its generation resource planning for adequately addressing the demand and supply variations/to meet the prescribed standard of LOLP/NENS conditions as stipulated by the Authority/Commission from time to time, if the same are not met with RAR using National Level PRM and approved/or specified by the Commission.

(v) **"State Transmission Utility (STU)"** means the Government Company notified as such by the State Government under sub-section (1) of Section 39 of the Act.

4.2 Words, terms and expressions as defined in the Electricity Act, 2003 and in the Rules made thereunder by the Central Government, Government of Kerala, Regulations issued by the Central Electricity Authority, the Central Electricity Regulatory Commission and the Commission, which are used in these Regulations, shall have and carry the same meanings as defined and assigned to them in the said Act, Rules and Regulations, as amended from time to time, unless it has been defined in these Regulations.

4.3 In the interpretation of these Regulations, unless the context otherwise requires:

(i) Words in the singular or plural term, as the case may be, shall also be deemed to include the plural or the singular term, respectively;

(ii) Words importing the masculine gender shall be taken to include females also;

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(iii) Reference to any Statute, Rule, Regulations or Guidelines shall be construed as including all statutory provisions consolidating, amending or replacing such Statute, Rule, Regulation or Guideline referred to, as the case may be;

(iv) Terms "include" and "including" shall be deemed to be followed by "without limitation" or "but not limited to", regardless of whether such terms are followed by such phrases or words of like import;

(v) If a question arises relating to the interpretation of any of the provisions of these Regulations, the decision of the Commission shall be final.

CHAPTER 2

GENERAL

5. *Resource Adequacy Framework.—*

5.1. Resource Adequacy framework entails the planning of generation resources for reliably meeting the projected demand in compliance with specified reliability standards for serving the load with an optimum generation mix at least cost and in secure manner.

5.2. Resource Adequacy framework shall cover following important steps:

a) Demand assessment and forecasting

b) Optimum Generation resource planning

c) Optimum Procurement planning

d) Monitoring and compliance

5.3. The time periods under long and short term for the purpose of Resource Adequacy planning under these Regulations shall be as defined under Regulation 4.1 of these Regulations

5.4. The distribution licensee and SLDC shall develop and prepare Long-Term Distribution Resource Adequacy Plan (LT-DRAP) and Short-Term Distribution Resource Adequacy Plan (ST-DRAP) respectively in accordance with the conditions outlined under these Regulations.

5.5. The capacity which the distribution licensee tie up shall be a judicious mix of long, medium and short-term contracts to ensure security of supply to their consumers at least cost. Reliance on power exchanges shall be limited to managing the power system for meeting contingency situations.

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CHAPTER 3
DEMAND ASSESSMENT AND FORECASTING

6. *Long-term Demand Forecast.–*

6.1. Demand assessment and forecasting is an important step for Resource Adequacy assessment. It shall entail at least hourly or sub-hourly assessment and forecasting of demand within the distribution area of distribution licensee for multiple horizons (short/ long-term) using comprehensive input data and policies and drivers and scientific mathematical modelling tools.

6.2. The distribution licensee shall be responsible for the assessment and forecasting of demand (MW) and energy (MWh) within its own control area and maintaining historical database.

6.3. The distribution licensee shall determine the load forecast for each consumer category for which the Commission has determined separate retail tariff.

6.4. The distribution licensee shall determine the load forecast for a customer category by adopting any of the following and/or combination of following methodologies, subject to guidelines issued by the Authority from time to time:

a) Compounded average growth rate (CAGR);

b) End use or partial end use;

c) Trend analysis;

d) Auto-regressive integrated moving average (ARIMA);

e) AI including machine learning, ANN techniques; and

f) Time Series/Econometric methods or any state-of-the art methods (specifying the parameters used, algorithm, and source of data).

6.5. The distribution licensee may use Electric Power Survey (EPS) projections as base and/or any other methodologies other than the above-mentioned after recording the merits of the method. Further, distribution licensee should use best fit of various methodologies for the purpose of demand/load forecast taking into consideration various scenarios (viz. most probable, pessimistic and optimistic) as outlined under Regulation 6.4. The licensee shall move towards probabilistic modelling in accordance with the guidelines to be published by the Commission.

6.6. For the purposes of deciding the load forecast for a customer category and the methodology to be used for load forecasting of a customer category, the distribution licensee must conduct statistical analysis and shall select the most appropriate method suitable for the State.

6.7. The distribution licensee shall utilize state-of-the-art tools, scientific and mathematical methodologies, and comprehensive database such as but not limited to weather data, historical data, demographic and econometric data,

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consumption profiles, impact of policies and drivers etc. as may be applicable to their control area.

6.8. The distribution licensee shall modify the load obtained on either side, for each customer category, by considering the impact for each of the but not limited to the following activities. The impact shall be considered by developing trajectories for each of the activities based on the economic parameters, policies, historical data, and projections for the future.

a) demand-side management;

b) open access;

c) distributed energy resources;

d) DSM and demand response measures;

e) electric vehicles;

f) data centres;

g) tariff signals;

h) changes in specific energy consumption,

i) increase in commercial activities with electrification

j) increase in number of agricultural pump sets and its solarization

k) changes in consumption pattern from seasonal consumers

l) availability of supply; and

m) policy influences such as 24X7 supply to all customers, LED penetration, efficient use of fans/appliances, increased use of appliances for cooking/heating applications, electrification policies, distributed energy resources, storage, and policies, which can impact econometric parameters, impact of national hydrogen mission. For each policy, a separate trajectory should be developed for each customer category.

6.9. The distribution licensee shall take into consideration any other factor not mentioned in clause 6.8 after recording the merits of its consideration.

6.10. The long-term/short-term load profile of the customer categories for which load research has been conducted may be refined on the basis of load research analysis. A detailed explanation for refinement conducted must be provided.

6.11. The summation of energy forecast (MWh) for various consumer categories upon adjusting for captive, prosumer and open access load forecast, as obtained as per clauses 6.4 to clause 6.10, as the case may be, shall be the load forecast for the licensee.

6.12. The licensee shall calculate the load forecasts (in MWh) by adding a loss trajectory approved by the Commission in the latest tariff order. In the absence

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of the loss trajectory as approved by the Commission for the planning horizon, an appropriate loss trajectory stipulated by State or National policies shall be considered with a detailed explanation.

6.13. The peak demand (in MW) shall be determined by considering the average load factor, load diversity factor, seasonal variation factors for the last three years and the load forecasts (in MWh) obtained in clause 6.12. Hourly and sub-hourly demand, expressed in MW, shall also be determined as part of the demand assessments as specified in these regulations. If any other appropriate load factor is considered for future years, a detailed explanation shall be provided.

6.14. The distribution licensee shall conduct sensitivity analysis to determine the most probable demand forecast. The distribution licensee must also develop long-term demand forecasts for possible scenarios, while ensuring that at least three different scenarios (most probable, pessimistic, and optimistic scenarios) are developed. The licensee shall move towards probabilistic modelling in accordance with the guidelines to be published by the Commission.

7. *Short term (Hourly/Sub-hourly) Demand Forecast and Aggregation at State.—*

7.1. The distribution licensee shall develop a methodology for hourly or sub-hourly demand forecasting and shall maintain a historical database.

7.2. For the purpose of ascertaining hourly load profile and for assessment of contribution of various customer categories to peak demand, load research analysis shall be conducted and influence of demand response, load shift measures, time of use shall be factored in by distribution licensee with inputs from state load despatch center. A detailed explanation for refinement conducted must be provided.

7.3. The distribution licensee shall utilize state-of-the-art tools, scientific & mathematical methodologies and comprehensive data such as but not limited to weather data, historical data, demographic and econometric data, consumption profiles, policies and drivers etc. as may be applicable to their control area.

7.4. The distribution licensee shall produce hourly or sub-hourly 1-year short-term (ST) forecasts and submit to SLDC by 30th April of each year for the ensuing year(s).

7.5. SLDC considering the load diversity, congruency, seasonal variation aspects shall submit state-level aggregate demand forecasts (MW and MWh) to the Authority and NLDC, RLDC and the Commission by 31st May of each year for the ensuing year(s).

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CHAPTER 4
GENERATION RESOURCE PLANNING

8. Generation resource assessment and planning is the second step after demand assessment and forecasting and entails assessment of the existing and contracted resources considering their capacity credit and identification of incremental capacity requirement to meet forecasted demand including planning reserve margin.

8.1 Generation Resource Planning shall involve the following steps namely:
(a) Capacity crediting of generation resources;
(b) Assessment of planning reserve margin; and
(c) Ascertaining resource adequacy requirement and developing optimum resource mix for the incremental capacity required.

9. *Methodology of preparation of Resource Adequacy Plan.—*

9.1. For preparation of Resource Adequacy Plans, data on the following needs to be obtained but not limited to:

a) Planning Reserve Margin for National Level as determined by CEA or the planning reserve margin determined by the distribution licensee, subject to maximum limit of optimal PRM and approved/or specified by the Commission for State Level PRM.

b) Actual demand met by the State/distribution licensee in granular time block resolutions (hourly/sub hourly) for last 5 years.

c) Estimated load growth during the planning period.

d) Technical parameters of conventional generation plants viz. Name of plant, location (State/Region), Capacity (MW) (for existing and planned capacities), Auxiliary Consumption (MW), Maximum and Minimum Generation Limits (MW), Ramp Up and Ramp Down Rate (MW/min), Minimum up and down time, Plant Availability Factor (% of time), etc.

e) Under-construction capacity/retirement of generation capacity/contracted capacity/bilateral contracts, including status of Fuel Supply Agreement, Associated Transmission Facilities, wherever applicable and timelines for completion of the project.

f) Potential investment options, technologies, gestation periods and lifetime of different assets.

g) Capacities and generation profile of renewable generation.

h) Capital costs, variable costs, O&M costs, reserve offers, start up and shut down Cost of generators, etc.

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i) Historical forced outage rates and planned maintenance rates of generation capacities.

j) Tie line details and transmission and distribution expansion plans.

k) Spinning reserve requirements.

l) Renewable Purchase Obligation (RPO), Energy Storage Obligation targets, etc.

9.2. The projected hourly or sub-hourly demand for the future years shall be used as inputs into the model. It shall be ensured that the generation expansion planning model chosen is capable of simulating on an hourly chronological resolution. This is necessary to capture the behaviour of the system with respect to ramping of conventional generation, profiles of RE generation, behaviour of energy storage, etc.

9.3. After establishment of demand profile for all future years, the model shall undertake an optimization exercise to minimize the total system cost to meet the future demand adhering to all power system parameters. Following constraints shall be considered while modelling:

(a) **Planning Reserve Margin/Resource Adequacy Requirement:** The Resource Adequacy Requirement (RAR) constraint shall ensure that the total Resource Adequacy (Generation capacity) of the distribution licensee fulfils the Planning Reserve Margin as determined by the Authority (National level PRM) and approved by the Commission. The resource adequacy requirement for the distribution licensee is computed as:

*RAR = contribution to forecasted national peak demand in GW *(1+National level PRM)*

From the supply side, the RAR is the sum of the "firm capacity" or "capacity credits" of contracted / planned capacities (including renewables, storage, other resources such as demand response) along with derated interconnection limits (imports). Both, supply side and demand side RAR shall match.

The capacity credits for generating resources and demand response resources to meet the national peak are as estimated by CEA. The capacity credits published by CEA for each resource type may differ between existing and new resources and between resources in different regions.

(b) **Portfolio balance constraints:** The portfolio balance constraints shall ensure that the total generation within a control area of State/Distribution licensee and the import of power to the control area of State/Distribution licensee is equal to the sum of the demand, the exports from the control area of State/ Distribution licensee, any energy not served and curtailment, for each hour.

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(c) **RE Generation constraints**: For renewable resources, such as solar and wind, the generation is constrained as per the hourly profile of the resource. Historic profiles of renewable sources shall be used to generate the hourly profiles.

(d) **Conventional Generation constraints:**

- Unlike solar and wind, thermal resources are dispatchable. However, the thermal resources are bound by constraints such as maximum and minimum generation limits, ramp rates, spinning reserve offers, plant availability and unit commitment decisions.

- The dispatch (energy offer) plus the reserve offer (if, specified through regulations) for each generator is constrained to be within the maximum and minimum generation limits. Generation between two consecutive time blocks also must be within the ramping capabilities of the resources. Unit commitment decisions, such as start-up/shut-down, minimum up and down times, etc., require binary variables to implement and are to be included. Additionally, generation units may have periods of outages which may need to be captured by using an availability factor.
- The capacity for each year needs to be tracked by a constraint which shall ensure that the capacity in a particular year is equal to the capacity last year plus any new capacity investment minus capacity retirement, if any.

(e) **RPO constraints:** Fulfilment of Renewable purchase obligation should be considered as one of the objectives of Resource Adequacy. Technology options like renewable generation for round the clock energy supply backed with storage (Battery and PSP), standalone renewable capacity along with hydro capacity for balancing renewable generation may be considered while carrying out resource adequacy exercise for distribution licensee.

(f) **Storage constraints:** Due to the intermittent nature of renewable generation, the need for resources which can store surplus energy and despatch the stored energy during low RE periods becomes vital. Storage charge and discharge at any instant are constrained by the storage level or the state of charge (SoC) of the storage resource, and the maximum charge/discharge limit. The resource can only discharge if there is sufficient energy present due to prior charging of the resource. To implement this, considering the chronological sequence of time is also important. Since storage resources convert electricity to other forms of energy, there are also some efficiency losses (round-trip efficiency) which shall be accounted for. Different technologies may have different discharge periods (energy limits), power outputs (maximum charge/discharge) and levels of efficiency.

Further, keeping Resource Adequacy in view, Storage charge and discharge at any instant cannot be simultaneous.

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(g) **Operating (Spinning) Reserve constraints**: Operating reserve constraints ensure that sufficient resources are in the system and kept online or on standby each hour to account for load forecast errors, intermittency of renewables or meeting contingencies in the real time. The operating reserve requirement shall be assessed based on discussions with the SLDC and shall be considered as an input parameter to the model or as specified in the national electricity policy, whichever is minimum. The SLDC from time to time shall specify the operating reserve requirement.

(h) **Demand Response**: Potential for demand side management such as shifting of load or demand response can be considered while undertaking the Resource Adequacy Plan (RAP). The constraints such as periods when load shifting can occur, and the maximum quantum of load which can be shifted over a period shall be included.

(i) **Transmission/Distribution Sub-Stations/line Constraints**: For the LT-DRAP commencing from 1st April 2027 onwards, the distribution licensee shall include Transmission and Distribution Sub-Stations/line constraints including cost and losses associated with it for transfer of power. If there are transmission/distribution sub-stations/line constraints, which are causing obstacles to cost effective and secure resource adequacy plan in terms of these Regulations, the same shall be brought immediately to the notice of the Commission and to the concerned licensee for taking appropriate measures for its removal.

10. *Capacity Crediting of Generation Resources including Storage and Calculation of Firm Capacity.—*

10.1. This step is important for determining how much of energy-limited resources (hydro, wind, solar, storage) may count toward resource adequacy requirements. Generation planning is set to become more complex as larger amounts of weather-based, variable renewable generation are added to the system. This is because resources such as wind and solar PV are intermittent, and their generation may not coincide with periods of peak demand.

10.2. Each generator can provide a "firm capacity," which represents the amount of power the generator can reliably provide. Capacity credit expresses firm capacity as a percentage of the installed nameplate capacity.

10.3. Following are the various methodologies to determine capacity credits of Renewable energy adopted internationally. These methodologies can also be extended to demand response resources.

(a) **Capacity credit approximation with Top Demand Hours:** In this case, a basic approximation of capacity credit can be obtained by averaging the

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historical contribution of a generator/generator class/storage during peak demand hours. The selection of how many peak demand hours to include may be refined based on experience.

(b) **Capacity credit approximation with Top Net Load Hours**: In this case, consideration is given to the fact that periods of system stress occur when high demand coincides with low renewable energy generation. A metric called 'net load' is defined as 'total renewable energy generation subtracted from overall demand', which must be met from dispatchable resources like thermal plants, hydro plants, etc. Due to system stress caused by the duck curve, net load is a better proxy for system stress for new capacities than peak demand. In this method, capacity credit can be obtained by averaging the contribution of a generator/generator class during top net load hours.

The Top Net Load based approach/methodology for determination of Capacity Credit factors for Renewable generation resources (including wind and solar) shall be adopted as under:

(i) For each year, the hourly recorded Gross Load for 8760 hours (or time-block) shall be arranged in descending order.

(ii) For each hour, the Net Load is calculated by subtracting the actual wind or solar or any other Renewable generation corresponding to that load for 8760 hours (or time-block) and then arranged in descending order similar to Step 1.

(iii) The difference between these two load duration curves represents the contribution of capacity factor of wind generation or solar or any other Renewable generation, as the case may be.

(iv) Installed capacity of wind or solar or any other Renewable generation capacity is summed up corresponding to the top 250 load hours.

(v) Total generation schedule from wind or solar generation or any other Renewable generation corresponding to these top 250 hours is summed up.

(vi) Resultant Capacity Credit (CC) factor is calculated as per formula below:

$$\text{CC factor} = \frac{\text{Sum of Wind or Solar or any other Renewable Generation schedule for top 250(i.e. x) hours}}{\text{Sum of Wind or Solar or any other Renewable Capacity for top 250(i.e. x) hours}}$$

(vii) The process for Capacity Credit factor determination shall be undertaken for each year for duration of past several years and the resultant Capacity Credit is the average of Capacity Credit values of past several years.

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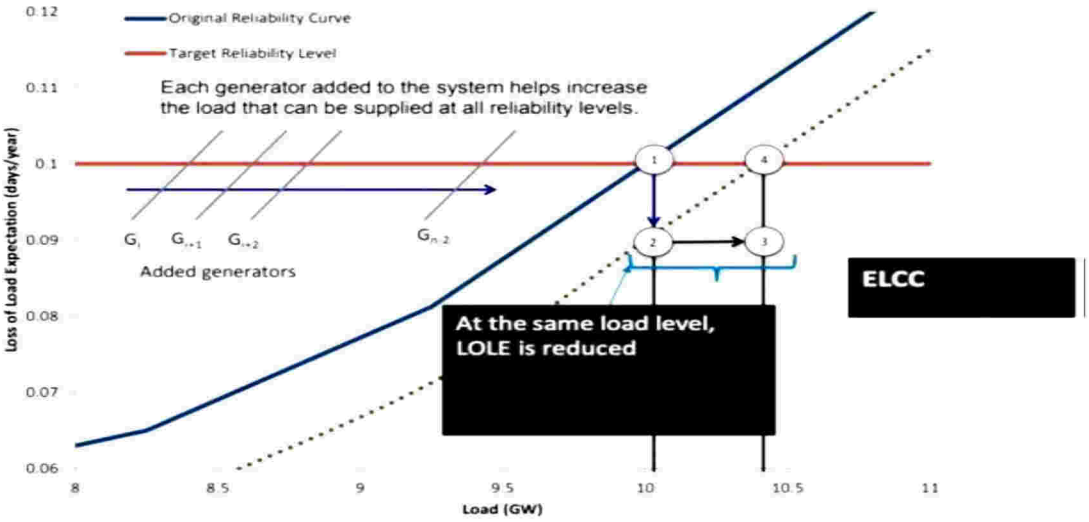
(c) **Expected Load carrying capability**.—

In this method, a model uses an hourly time-series demand data for a particular period. The model also uses the availability of different generation resources in each hour of the year. Random outages of generators are also applied considering the historical and expected outage conditions. Determine supply matching is used to determine the LOLP of the system**.**



- To calculate capacity credit, the model first removes a generator from the system and calculates the system LOLP. This represents Point 1 in the system reliability curve, as shown alongside.

- The model then adds the generator back to the system and repeats the LOLP calculation. The additional generator increases system-wide firm capacity and resource adequacy, so that the curve shifts right to Point 2 (system reliability is higher), and so it can accommodate more load at the previous LOLP (Point 4). The additional load that can be accommodated represents the generator's ELCC.

10.4 Considering the variability and uncertain nature of Renewable Energy Resources, the Capacity Factor Approximation with Top Net Load Hours can be considered to determine the capacity credits for Renewable Energy Resources. The ELCC method can be adopted later, once the required capabilities and data are available. Always, among these two methods, the one which results closer to the actual values i.e. tighter of the two methods shall be applied. If there is any deviation from these approaches, the Distribution Licensee have to furnish detailed explanation with reasons behind it.

10.5 Capacity Credit factors for hydro generation resources shall be computed based on water availability with different Capacity Credit factors for run-of-the-river hydro power projects and dam-based/storage-based hydro power projects. The thermal capacity credit is computed by reducing the auxiliary

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consumption and the forced outage rate from the installed capacity alongside considering fuel availability. Storage Capacity Credit shall take into account annual degradation and other relevant factors. Planned outage rate is generally not considered, as planned maintenance may be carried out during low net-demand periods and thus may not affect reliability.

10.6 The licensee needs to plan their firm capacity as per their contribution in the national peak which implies that the capacity credits of all resource types are to be calculated on the national level load profile. However, the distribution licensee shall contract additional resources source-wise, if required, considering capacity credits of resource types calculated based on its own load profile.

10.7 The calculation of firm capacity to meet the Resource Adequacy Requirement (RAR) is shown below.

$$
\begin{aligned}
RAR = & \sum_{i=1}^{num\_solar} Solar\_Capacity * Solar\_Capacity\_Credit \\
& + \sum_{i=1}^{num\_wind} Wind\_Capacity * Wind\_Capacity\_Credit \\
& + \sum_{i=1}^{num\_hydro} Hydro\_Capacity * Hydro\_Capacity\_Credit \\
& + \sum_{i=1}^{num\_thermal} Thermal\_Capacity * Thermal\_Capacity\_Credit \\
& + \sum_{i=1}^{num\_nuclear} Nuclear\_Capacity * Nuclear\_Capacity\_Credit \\
& + \sum_{i=1}^{num\_storage} Storage\_Capacity * Storage\_Capacity\_Credit \\
& + \sum_{i=1}^{num\_other} OtherResource\_Capacity \text{ including Demand Response} * \\
& \quad otherResource\_Capacity\_Credit
\end{aligned}
$$

Note:—The total firm capacities calculated based on capacity credits and sourced from outside the State shall not exceed the available import limit.

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11. *Ascertaining Resource Adequacy Requirement*.—

11.1. The distribution licensee and SLDC as applicable shall provide to Authority, NLDC, SRLDC and the Commission by 31st May of every year, the details regarding demand forecasts (peak and energy requirement) for the next 10 years, assessment of existing generation resources and such other details as may be required for the LT-NRAP and ST-NRAP as specified in RA Guidelines.

11.2. The reports of LT-NRAP and ST-NRAP as published respectively by Authority and NLDC by 31st July of every year, in line with RA Guidelines, for the period starting from the month of April in the subsequent year, specifies the following:

The report of LT-NRAP, published by Authority:

a) The National level PRM as a guidance for the States/UTs to consider while undertaking their RA exercises.

b) The Optimal Generation mix for the next 10 years required to ensure that the national level system is RA compliant while meeting the all-India demand at least-cost. This shall guide capacity buildout investments in the country.

c) The capacity credits for different resource types on a regional basis.

d) Each State/UT's contribution towards national peak (peak contribution).

The report of ST-NRAP published by NLDC:

The parameters such as demand forecasts, resource availability based on under construction status of new projects, planned maintenance schedules of existing stations, station-wise historic forced outage rates and decommissioning plans.

11.3 Based on the share in national peak provided in LT-NRAP, distribution licensee shall plan to contract the capacities (peak contribution * (1+National level PRM)) to meet their Resource Adequacy Requirement (RAR) at the time of national peak. The distribution licensee shall demonstrate to the Commission 100% tie-up for the first year and a minimum 90% tie-up for the second year to meet the requirement of their contribution towards meeting national peak. Only resources with long/ medium/short-term contracts shall be considered to contribute to the RAR.

As a general guidance, the share of long-term contracts including own generation is to be in the range of 75-80% of the total supply side RAR. The medium–term contracts may be in the range of 10% - 20% of the total supply side RAR while the rest can be met through short-term contracts. Power procurement through the power exchanges, such as the Day-Ahead Market segment, shall not be considered to contribute to RAR. However, these ratios of long-, medium-and short-term

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contracts may be reviewed periodically by the Commission based on further experience.

For subsequent three years, the distribution licensee shall furnish a plan to meet estimate requirement of their contribution to meet national peak for the Commission's approval.

11.4 The Distribution licensee shall undertake a Resource Adequacy Plan (RAP) for a 10-year horizon (Long-term Distribution Licensee Resource Adequacy Plan (LT-DRAP)) to meet their own peak and electrical energy requirement. The plan shall be vetted/validated by the Authority for leveraging the benefit of national level optimization for the Distribution licensee. The LT-DRAP shall be undertaken as per the methodology outlined in these Regulations. Further,

(a) The Distribution licensee shall follow State-level capacity credits as specified in Regulation 19.4 or take inputs if required from the LT-NRAP like PRM, capacity credits, etc., while formulating their LT-DRAP and submit their Resource Adequacy plans to CEA by 30th September of each year for the period starting from the month of April in the subsequent year.

(b) After being vetted by CEA, the LT-DRAP along with details for meeting the RAR of national peak for the Distribution licensee and its own peak and electrical energy requirement shall be submitted to the Commission by the Distribution licensee(s) by 30th November of each year for the period starting from the month of April in the subsequent year, for its approval.

(c) The Distribution licensee shall submit all the assumptions relied by it in arriving at the optimal generation mix, including capital costs, variable costs, O & M costs etc. for each generation source/energy storage system. The distribution licensee shall submit the various alternatives considered for arriving at the optimal resource mix along with total estimated cost in each of the scenarios. The Commission shall approve the Distribution licensee(s) contracting plan for coincident peak contribution and to meet their own energy and peak considering the fulfillment of conditions by the Distribution licensee(s) under these Regulations and subject to other terms and conditions of these Regulations by 31st December of each year for the period starting from the month of April in the subsequent year.

(d) Distribution licensee is free to consider optimal planning reserve margins as defined under 'State Level PRM' in Clause 4.1 of these Regulations, subject to approval from the Commission.

(e) The LT-DRAP shall be carried out by the distribution licensee on an annual rolling basis considering the contracted capacity as a part of the system and shall optimize for additional capacity required.

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11.5 The Distribution licensee, through the LT-DRAP, shall submit to the Commission specific plans to meet at least 100% and 90% of their peak demand and energy requirement for the first and second year respectively, subject to adequately addressing the demand and supply variations/to meet the prescribed standard of LOLP/NENS conditions as stipulated by the Authority/Commission from time to time, with a mix of long-term, medium-term and short-term contracts, including power exchanges.

Provided that, the Distribution licensee shall submit to the Commission, the estimated resource mix to meet 100% of the requirement of peak demand and energy requirement for the entire control period for which application for determination of retail supply tariff shall be made before the Commission, subject to other constraints in meeting the peak demand and energy requirement.

The composition of the contracts shall depend upon the load curve of the distribution licensee. The share of long-term contracts is to be at least 75% of the required capacities as per LT-DRAP or as specified by the Commission. The medium–term contracts may be in range of 10-20% while the rest can be met through short-term contracts. For subsequent years of the planning horizon, distribution licensee shall demonstrate their plans to contract existing capacities and plans to build or contract future capacity.

Keeping reliability and cost economics, the Commission from time to time by an order may prescribe 'State Level PRM' and same needs to be considered by the SLDC/distribution licensee with respect to their peak demand and energy requirement.

11.6 The Distribution Licensee shall submit the details of the contracted capacities for the ensuing year for meeting RAR of national peak to the SLDC after approval of the Commission by 31st January of each year. The SLDC shall submit the information to the SRLDC by 15th February of each year. The SRLDC will be aggregating the capacities at the regional level and will be submitting the information to the NLDC by 28th of February of each year. NLDC will be aggregating the capacities at the national level and check compliance with ST-NRAP and identify shortfall for the ensuing year, if any. In case of shortfall, NLDC will either communicate the shortfall to the Commission for compliance by distribution licensee or facilitate a national-level auction for the balance capacity with participation from distribution licensee with capacity shortfall. The contracting for the balance capacity shortfall shall be completed by the month of March prior to the start of the delivery year (1st April). The procedure notified by NLDC shall be adopted by the distribution licensee to participate in the national level auction for the procurement of the balance capacity.

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11.7 In similar lines with ST-NRAP, the SLDC shall prepare one-year look ahead ST-DRAP, on an annual basis for operational planning, at the state level based on the LT-DRAP study results. The SLDC shall aggregate the capacities at the State level and check compliance with ST-DRAP and identify shortfall for the ensuing year, if any. In case of shortfall, SLDC will communicate the shortfall to the distribution licensee for compliance. Further, the SLDC shall review the ST-DRAP on a daily, weekly, monthly and quarterly basis based on actual availability of generation resources and coordinate with the distribution licensee for compliance.

11.8 The abstract of Resource Adequacy implementation timelines is specified in Regulation 22 of these Regulations.

12. *Determination of LOLP/NENS, Optimal Planning Reserve Margin and Resource adequacy targets*.—

12.1. The optimal level of "target" or "planning" reserve margins should be arrived at through measures such as "Loss of Load Probability (LoLP)" and Normalized Energy Not Served (NENS). Loss of load can happen due to various factors such as:

- Forced outages/planned maintenance of conventional generation
- Real time unforeseen excursion in demand/demand forecast errors
- Generation forecast errors/RE intermittency

12.2. A loss of load occurs when the system load exceeds available capacity in a particular time. Appropriate LOLP/NENS metrics should be considered based on consultation with stakeholders and international best practices.

12.3. The first step in determining the Resource Adequacy targets would be to determine the target generation capacities at a nominal Planning Reserve Margin using a generation planning model.

12.4. Once the generation capacities are estimated, it becomes important to estimate the several demand-supply patterns and then determine if the required generation capacity in the system can always meet demand reliably by calculating the loss of load and energy not served. A natural outcome of the above objective is to construct many possible future scenarios based on the uncertainty surrounding the demand for power, intermittency of RE sources, availability of power plants,

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tie-lines, inter-state and inter-regional transmission constraints etc. These future scenarios shall be constructed based on following indicative parameters viz:

- Demand variations/forecast errors
- Hydro conditions (normal, wet, or dry years)
- Planned and forced outages of power plants and interconnectors
- RE Generation forecast errors, etc.

12.5. Multiple future scenarios should be created using stochastic models to account for uncertainty and analyse any occurrence of lost load. Each such future scenario is established based on historical data. The key inputs for generating future possible states are as follows:

- **Demand volatility:** Uncertainty in demand can be built into the model through two categories, long-term uncertainty driven by underlying factors such as load growth forecasting errors, unanticipated economic growth, etc., and short-term uncertainty which may be defined as the sum of a typical (or mean) monthly load pattern for the day and the historical deviation observed from the mean load.

- **Conventional generator outages:** Planned outages and scheduled maintenance for thermal generators may be scheduled either based on historic patterns or during low demand periods based on a uniform probability distribution. For forced outages, Monte Carlo draws for each unit based on historical outage rates may be simulated.

- **Variable Renewable Generation Intermittency**: To capture the intermittency of solar and wind plants, solar PV and wind generation data of past several years can be analysed and multiple scenarios which match the projected CUF levels may be created. Annual CUF projections may also be generated through Monte Carlo Draws based on the annual CUFs observed in the historical profiles.

- **Availability of ATC for short-term import**: In the distribution licensee-level/State-level planning, short-term import is limited to the available transfer capability. However, as there is no visibility about the power generation profile of other States, unpredictability in the availability of tie line power from other utilities and regions must be factored in. To incorporate the above-mentioned unpredictability, availability of each tie line for each hour can be derated by a factor drawn from a probability

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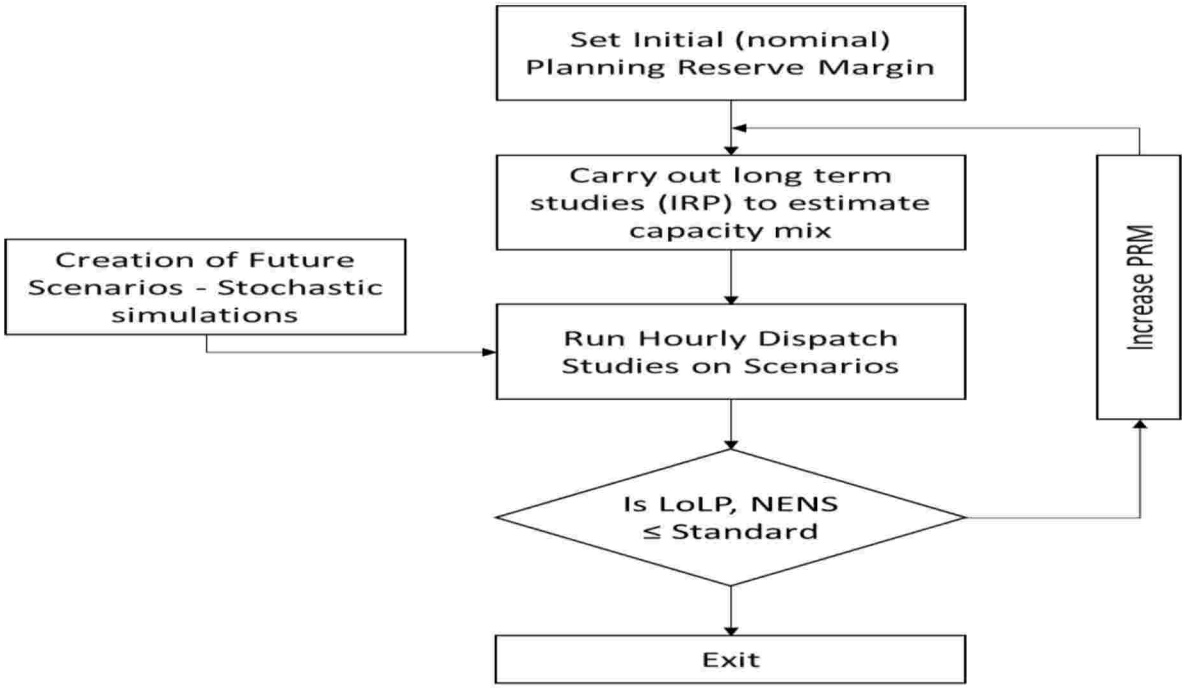
distribution using Monte Carlo Simulations. Details on the appropriate probability distribution to be considered may be taken as provided by NLDC/CEA from time to time.

12.6 Once the demand-supply projections/scenarios are established and the possible future states are predicted, a demand-supply matching simulation with the estimated capacities should be performed. The objective of such a simulation would be to use the capacities obtained from the Resource Adequacy Plan to meet the demand and assess the duration of the loss of load events and energy not served for each scenario and for the specified planning margin/capacity mix.

12.7 The above process needs to be then iterated by incrementing the planning reserve margin levels until the desired levels of LOLP/NENS is achieved in the system. This iterative model would enable identification of a target PRM level as per the desired LOLP figures. An illustrative flowchart of the process is shown below.


Set Initial (nominal) Planning Reserve Margin
Carry out long term studies (IRP) to estimate capacity mix
Creation of Future Scenarios - Stochastic simulations
Run Hourly Dispatch Studies on Scenarios
Increase PRM
Is LoLP, NENS ≤ Standard
Exit

Flow Chart of Optimal Reserve Margin Study

12.8 While arriving at the target LOLP/NENS figures, consideration should be given to system costs. The objective should be to have an optimal level of Reserve margins which would represent the optimal trade-off between system costs and reliability. For this purpose, an evaluation of the marginal cost of reducing load shed is required. The PRM at which the marginal cost of reducing load shed is equal to the value of Lost Load as defined by the distribution licensee is the economically optimal PRM.

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CHAPTER 5

POWER PROCUREMENT PLANNING

13. Procurement planning shall consist of (a) determining the optimal power procurement resource mix, (b) deciding on the modalities of procurement type and tenure, and (c) engaging in the capacity trading or sharing to minimize risk of resource shortfall and to maximize rewards of avoiding stranded capacity or contracted generation.

14. *Procurement of Resource Mix*.—

14.1 The distribution licensee in its power procurement strategy shall identify an optimal procurement of generation resource mix to enable smooth RE integration in its portfolio of power procurement resource options while meeting reliability standards.

14.2 For identification of the optimal generation procurement resource mix, optimization techniques and least-cost modelling shall be employed in order to avoid stranding of assets. The distribution licensee shall engage in adoption of least cost modelling and optimization techniques and demonstrate the same in its overall power procurement planning exercise to be submitted to the Commission for its approval.

14.3 Procurement by distribution licensee shall be consistent with the identified resource mix and considering overall national electricity plan and policies notified by the Appropriate Government from time to time.

14.4 The outcome of the Resource Adequacy Studies shall provide the quantum and type of generation resources required in the portfolio of a distribution licensee to meet the demand in an optimal (least cost and secure) manner. The future capacity mix may comprise of existing capacities, planned capacities and capacity addition required to meet the increasing demand of the distribution licensee considering appropriate gestation period of the generation resource.

14.5 The distribution licensee shall contract the optimal portfolio of resources to meet its future demand and Resource Adequacy Requirement (RAR) obligations, based on the output derived from the LT-NRAP study results. Long/ medium/short-term firm contracts of generation resources shall be considered to contribute to the RAR. Power procurement through the power exchanges, such as the Day-Ahead Market segment, shall not be considered to contribute to RAR.

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14.6 The distribution licensee shall contract additional resources source-wise including power exchanges, if required based on the LT-DRAP to meet its own peak demand subject to approval by the Commission.

14.7 The distribution licensee can take measures either to put up their own generation capacities for meeting their future demand or shall procure the required resources under section 62 of the Electricity Act 2003 or through the tariff based competitive bidding guidelines for procurement of power notified under the provisions of section 63 of the Electricity Act 2003.

14.8 The power capacity procurement from renewable energy sources for fulfilling the RPO targets shall be carried out taking into account the RE potential in the State and fungibility within the RE resources as specified in the Renewable Energy Regulations of the Commission. The power procurement corresponding to wind, solar PV, Wind solar Hybrid, Round the Clock (RTC) power shall be carried out as per the guidelines for tariff based competitive bidding process for procurement of power from respective grid connected wind, solar PV, Wind solar Hybrid, Round the Clock (RTC) power projects.

14.9 The Distribution Licensee can contract storage capacity corresponding to the results of LTDRAP capacity addition requirement for future years as per the guidelines issued under the provisions of Section 63 of the Electricity Act, 2003 for procurement of energy from Energy Storage Systems through competitive bidding, from grid connected Projects.

14.10 The Distribution Licensee can contract power through Central Agencies/ Intermediaries/Traders/Aggregators/Power Exchanges or through bilateral agreements/Banking arrangement/Capacity sharing with other distribution licensees. The Distribution Licensee can carry out power procurement on short-term and medium-term basis through DEEP, PUShP portal or any other platforms approved by the Central Government or Central Electricity Regulatory Commission.

14.11 The distribution licensee must ensure that procurement process for the projected demand is undertaken and completed sufficiently in advance so that the procured capacity becomes available when it is required to serve the projected load. The following table gives the indicative number of years before which procurement process must be completed in advance as compared to the year of projected requirement for various types of generation and types of procurement:

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Resource	Long Term	Medium Term
Coal/Lignite based Capacity	7	2
Hydro	9	2
Solar	2	1
Wind	3	1
PSP	5	3
Other Storage	2	1
Nuclear	9	3

15. *Special Provision*.—

For more authenticity and accuracy, the distribution licensee can opt for more granular time periods than prescribed or specified by the Authority/Commission for formulating LT-DRAP for the entire planning horizon or selected period in line with LT-NRAP.

16. *Approval of Power Purchase Agreement*.—

16.1 Any new Capacity arrangement/tie-up shall be subject to the prior approval of the Commission.

16.2 All procurement of Long/Medium/Short-term power from various sources shall be carried out as per the Guidelines/Rules/Regulations/Policies issued by the Central Government/Appropriate Commission from time to time.

16.3 Any new power purchase agreement/power sale agreement for Long/Medium/Short-term or amendments to existing Long/Medium/Short-term Power Purchase Agreement (PPA's)/Power Sale Agreement (PSA) entered into by the distribution licensee shall be subject to the prior approval of the Commission.

16.4 The distribution licensee shall submit the list of all existing Power Purchase Agreements/tie-ups executed with different conventional power plants as well as RE Generators/Energy Storage Systems to the Commission along with the Resource Adequacy plan.

17. *Variation in Power Purchase*.—

17.1 The distribution licensee may procure power in deviation from the approved resource adequacy plan, in contingencies and for portfolio optimization, in accordance with provisions of the KSERC (Terms and Conditions for Determination of Tariff) Regulations, 2021 as amended or replaced from time to time.

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CHAPTER 6

MONITORING AND COMPLIANCE

18. *Monitoring and Compliance.*—

18.1 **Monitoring and Reporting**: The distribution licensee and SLDC shall abide by the timelines, procedure and methodology specified under these Regulations. The Distribution Licensee should monitor the entire process and shall submit quarterly compliance to the Commission.

18.2 **Treatment for shortfall in RA Compliance**: Distribution licensee shall comply with the RA requirement and in case of non-compliance, appropriate non-compliance charge shall be applicable for the shortfall for RA compliance, which shall be determined on case-to-case basis.

CHAPTER 7

ROLES, RESPONSIBILITIES AND TIMELINES

19. *Data Requirement and Sharing Protocol.*—

19.1 The Distribution licensee shall maintain and share with STU/SLDC all data related to demand assessment and forecasting such as but not limited to consumer data, historical demand data, weather data, demographic and econometric variables, T&D losses, actual electrical energy requirement and availability including curtailment, peak electricity demand, and peak met along with changes in demand profile (e.g.: electric vehicles, cooling demand etc.), historical hourly load shape, etc.

19.2 The Distribution Licensee shall maintain comprehensive statistics and databases relating to policies and demand drivers, including but not limited to: household-level indicators such as LED adoption, penetration of energy-efficient fans and appliances, and increased use of electricity for cooling, cooking; growth in commercial activities across geographic areas and regions; increase in the number of agricultural pumps and their solarization within the control area; changes in specific energy consumption and overall consumption patterns, including those of seasonal consumers such as tea plantations; implementation and impacts of Demand Side Management initiatives and Distributed Energy Resources; adoption of Electric Vehicles and Open Access; data centres; developments under the National Hydrogen Mission; and reduction in Aggregate Technical and Commercial (AT&C) losses.

19.3 Distribution Licensee shall maintain at least past 10 years of statistics in its database pertaining to consumption profiles for each class of consumers, such as domestic, commercial, public lighting, public water works, irrigation, industries,

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railway traction, bulk, open access, captive power plants, insights from load survey, contribution of consumer category to peak demand, seasonal variation aspects, etc.

19.4 The distribution licensee shall share information and data pertaining to the existing and contracted capacities with their technical and financial characteristics with SLDC for computation of state-level capacity credit factors and for preparation of state-level assessment.

19.5 SLDC shall maintain the statistics and database pertaining to aggregate demand assessment and forecasting data mentioned above and share state-level assessment with the Authority and the NLDC for regional/national assessment from time to time.

19.6 SLDC shall aggregate generation data and share state-level assessment with the Authority and NLDC for assessment of Resource Adequacy requirement.

19.7 It shall be the responsibility of the Distribution Licensee and the State Load Despatch Centre (SLDC) to possess, furnish, and utilize authenticated and realistic data and inputs for the preparation of the Resource Adequacy Plan, including demand forecasting. In the event that any unauthenticated or unrealistic data or inputs are found to be furnished or used by the Distribution Licensee or the SLDC, the Commission may, after following due process and providing the concerned entity an opportunity to be heard, impose such penalty as it may deem appropriate. Any penalty so imposed shall not be allowed to be passed through in the tariff.

20. *Publication of the information on website.—*

20.1 The monthly/weekly/day-ahead/intraday power procurements/sale by the distribution licensee and generator schedule shall be made available on the websites of the distribution licensee and SLDC within 15 days of such procurements/sale with ease of access to the current as well as archived data and the same shall be in a standardized format with downloadable facility for all.

20.2 SLDC shall also publish the monthly Merit Order Despatch (MoD) stack along with per unit variable cost of each generating station on its website.

21. *Constitution of dedicated Cells by Distribution Licensee.—*

21.1 The Distribution Licensee shall establish a multi-disciplinary dedicated cell for developing, monitoring and compliance of Resource Adequacy Plan. The Cell shall have the requisite capability and state of the art analytical tools/ AI tools for demand forecast, capacity, RE integration, etc. The cell will provide the flexibility to adopt and integrate emerging technologies, including AI-driven tools, to enhance analytical capabilities such as cost–benefit analysis and strategic assessments.

21.2 The Distribution Licensee shall make the Resource Adequacy Plan in consultation with State Sector Generating Companies, other Distribution Licensees, Central

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Sector Generating Companies, National / Regional / State Load Despatch Centres, and the Authority.

22. *Resource Adequacy Implementation Timelines*.—

22.1 The Resource Adequacy implementation shall adhere to the timelines specified below. In the event of deviations, the Commission may exercise its discretion to revise said timelines, taking into account the reasons for such deviations and the overarching objectives of these Regulations.

(i) **30th April**: Distribution licensee shall submit demand forecasts to SLDC by 30th April of each year for the ensuring year(s) along with requisite information/ details.

(ii) **31st May:** The SLDC, on behalf of the distribution licensee in the State shall provide to Authority, NLDC, SRLDC and the Commission by 31st May every year, the details regarding demand forecasts (peak and energy requirement) for the next 10 years, assessment of existing generation resources and such other details as may be required for LT-NRAP and ST-NRAP.

(iii) **31st July**: Publishing of LT-NRAP and ST-NRAP respectively by Authority and NLDC by 31st July for the period starting from the month of April in the subsequent year.

(iv) **30th September**: The distribution licensee shall formulate their LT-DRAP and submit their resource adequacy plans to CEA by 30th September for the period starting from the month of April in the subsequent year for it vetting/validation.

(v) **30th November**: After being vetted by CEA, the LT-DRAP along with details for meeting the RAR of national peak for the Distribution licensee and its own peak and energy requirement shall be submitted to the Commission by the Distribution licensee(s) by 30th November for the period starting from the month of April in the subsequent year for approval.

(vi) **31st December:** The Commission shall approve the Distribution licensee(s) contracting plan for coincident peak contribution and to meet their own energy and peak by 31st December of each year for the period starting from the month of April in the subsequent year.

(vii) **31st January**: The Distribution Licensee by 31st January shall submit the details of the contracted capacities for the ensuing year for meeting RAR of national peak to the SLDC after approval of the Commission.

(viii) **15th February**: The SLDC shall aggregate the total contracted capacities at the state level and submit the information to the SRLDC by 15th February.

(ix) **28th February**: SRLDC shall aggregate the capacities at the regional level and submit the information to the NLDC by 28th February.

(x) **March:** In case of shortfall in RAR at the time of national peak, NLDC communication to the Commission on shortfall for compliance or NLDC will

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facilitate a national-level auction for the balance capacity with participation from distribution licensee with capacity shortfall. The contracting for the balance capacity shortfall shall be completed by the month of March prior to the start of the delivery year (1st April).

CHAPTER 8
MISCELLANEOUS

23. *Availability of mathematical modelling tools and study conducted for inspection.*—

23.1 The mathematical modelling tools and study conducted by the distribution licensee/SLDC for Resource Adequacy Planning on directions by the Commission should be demonstrated to the Commission. Such demonstration shall include outcomes under different scenarios.

24. *Power to Give Directions*.—

24.1 The Commission may from time to time issue such directions and orders as considered appropriate for implementation of these Regulations.

25. *Power to Relax*.—

25.1 The Commission for reasons to be recorded in writing, may relax any of the provisions of these Regulations on its own motion or on an application made before it by an interested person.

26. *Powers to Amend*.—

26.1 The Commission may, at any time, vary, alter, modify or amend any provisions of these Regulations.

27. *Power to Remove Difficulties*.—

27.1 If any difficulty arises in giving effect to any of the provisions of these Regulations, the Commission may, by general or special order, make such provisions, not inconsistent to the provisions of the Act and these Regulations, as may appear to be necessary for removing the difficulty.

By Order of the Commission,

RAJENDRAN K. V.
Secretary.

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Explanatory Note

(This does not form part of the notification, but is intended to indicate its general purport.)

In exercise of the powers conferred under Section 176 of the Electricity Act, 2003 (36 of 2003), the Ministry of Power, Government of India, notified the Electricity (Amendment) Rules, 2022 on 29th December 2022. Subsequently, in exercise of the powers conferred under Rule 16(1) of the said Rules, the Government issued the Guidelines for Resource Adequacy Planning Framework for India on 28th June 2023, in consultation with the Central Electricity Authority.

As per Rule 16(2) of the said Rules, the State Commissions are required to frame regulations on resource adequacy in accordance with the aforesaid guidelines and the model regulations, if any, framed by the Forum of Regulators. In this regard, the Forum of Regulators framed the Model Regulations for Resource Adequacy Framework in June 2023.

In view of the above, the Commission decided to notify regulations on resource adequacy for the State of Kerala. Accordingly, the Commission notified the draft Kerala State Electricity Regulatory Commission (Framework for Resource Adequacy) Regulations, 2026 on 4th February 2026. The need for a Resource Adequacy (RA) framework in Kerala is explained in the preamble of these regulations. Kerala, one of India's leading progressive states, must ensure a reliable and affordable electricity supply to sustain its economic growth. With rising demand and increasing penetration of renewable energy, characterized by variability and intermittency, effective RA planning becomes essential. The RA regulations will help Kerala maintain grid stability, ensure adequate power capacity, and support the State's goal of meeting 100% of its energy needs from renewable sources by 2040, while also managing its dependence on external power imports. The draft regulations were placed in the public domain on the same date, inviting objections, comments, and suggestions from stakeholders on or before 25th February 2026. The draft regulations were also forwarded to all licensees in the State vide letter dated 11th February 2026, seeking their views and comments. Further, a press release was issued on 17th February 2026 informing stakeholders about the public hearing.

For participation in the online public hearing, a dedicated registration portal was made operational. The Commission conducted the public hearing on the draft regulations on 25th February 2026 at Thiruvananthapuram through online mode. KSEB Limited and the Centre for Energy Regulation (CER) and the Energy Analytics Lab (EAL), Indian Institute of Technology Kanpur, offered detailed remarks and suggestions during the hearing. KSEB Limited and Centre for Energy Regulation, IIT, Kanpur submitted their detailed written comments also. The buyer licensees in Kerala, namely Thrissur Corporation Electricity

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Department, Rubber Park of India Limited, and Technopark also submitted their written comments.

After considering the objections and suggestions received in writing and during the public hearing, the Commission approved the final Kerala State Electricity Regulatory Commission (Framework for Resource Adequacy) Regulations, 2026 and decided to publish the same in the Official Gazette.

This notification is intended to achieve the above object.

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